47 BUILDING
The Dow Chemical Company
Midland, Michigan 48674

May 1, 2006

Mr. George Bruchmann
Chief, Waste and Hazardous Materials Division
Michigan Department of Environmental Quality
Constitution Hall
525 W. Allegan Street
P.O. Box 30473
Lansing, MI 48909

Re: **Sampling Approach in Support of Bioavailability Study, Midland Area Soils**

Dear Mr. Bruchmann:

This letter sets forth the response of The Dow Chemical Company ("Dow") to the Michigan Department of Environmental Quality ("MDEQ")' March 2nd Notice of Deficiency (NOD), Comment 10 and MDEQ's April 13th Response to Comments and NOD Attachment 4 Comments. The attachment describes the approach for modification and resubmittal of the *Midland Representative Soils Sampling and Analysis Plan In Support of Bioavailability Study* (BSAP). The approach described in the attachment reflects the consensus reached between Dow, MDEQ, and U.S. Environmental Protection Agency (USEPA) Region 5 on April 20, 2006.

Your staff will be contacted shortly by CH2M Hill to arrange a meeting to select the final locations of the sample areas ("boxes") from which the final sampling plan will be built around. As discussed the final work plan will be submitted for MDEQ review and approval by June 1, 2006.

We look forward to working with you and the MDEQ staff to meet the goal of commencing field work for the summer season.

Regards,

Ben Baker
Senior Environmental Project Leader
Michigan Operations
47 Building
Midland, MI 48667

Attachment (1)

cc: Jack Bails, Public Sector Consultants
Greg Rudloff, US EPA
Jim Sygo, MDEQ

Sampling Approach in Support of Bioavailability Study, Midland Area Soils

This document sets forth the response of The Dow Chemical Company ("Dow") to the Michigan Department of Environmental Quality ("MDEQ") March 2nd Notice of Deficiency (NOD), Comment 10 and MDEQ's April 13th Response to Comments (NOD Attachment 4 Comments). This memorandum outlines the approach for modification and resubmittal of the *Midland Representative Soils Sampling and Analysis Plan In Support of Bioavailabilty Study* (BSAP). The approach described reflects the consensus reached between Dow, MDEQ, and U.S. Environmental Protection Agency (USEPA) Region 5 on April 20, 2006.

Study Objectives

The objectives of the BSAP are as follows:

- **Support Bioavailability Study**
  - Characterize the distribution of properties reported to influence bioavailability & guide sampling efforts to obtain representative soil samples for future bioavailability study
- **Provide Information on Hazardous Substances**
  - Develop additional info on the nature and extent of dioxin/furan concentrations in Midland Soils & perform preliminary screen of other hazardous substances
- **Consider Community Concerns**
  - Maintain the confidentiality of private property owners whose properties are sampled
- **Facilitate review of the final work plan and results by an Independent Science Advisory Panel (ISAP)**

General Sampling Design

The sampling pattern shown in Figure 1 consists of 23 radial transects extending from the Dow Midland Plant site. This design accounts for multiple sources at the site, with aerial deposition of hazardous constituents to surface soils as the primary transport mechanism. The sampling design is based on meeting the objective of providing additional information on hazardous substances in the study area, but is expected to also be sufficient for providing information on soil characteristics in support of the Bioavailability Study.

The basic elements of the design are:

- Potential major point and non-point sources (i.e. incinerator complex, power plants, brine electrocution, track-out, etc.) within the Dow Plant boundaries are combined to create an origin for the transects. The origin location was established by MDEQ.
- Sample locations are biased to collect more samples in the dominant downwind direction utilizing the wind rose from meteorological station No. 72639 to delineate

dominant wind directions (wind rose zone selected rays greater than 6% which in total represent 75% predominance of the wind direction during 1987 - 91).

- A minimum of 22 transects were selected based on S3TM guidance as calculated by MDEQ. Seventeen (17) of the twenty two (22) transects will be located to correspond to the 75% dominant wind direction with remaining transects distributed over the remaining area. An additional transect was added to increase coverage in the southwest for a total of 23 transects.
- Transects will extend to a distance of approximately 9,400 feet from the origin location and extend a minimum of 3,000 feet beyond the Dow Plant facility boundary. In order to ensure sufficient lateral coverage into residential areas for use in support of the bioavailability study, every other transect in the dominant wind direction extends to approximately 10,000 to 11,000 feet from the Dow Plant facility boundary.
- Samples are to be collected from within "sample stations" located every 950 feet along each transect beginning just beyond the Dow Midland Plant facility boundary. The distance between sampling stations was established by MDEQ.

General Sampling Design to Address Community Concerns

In order to address community concerns that sampling results not be associated with individual private property owners before site-specific cleanup criteria are approved, a sample "blinding" procedure has been developed. The basic elements of the procedure consist of the following:

- Sample stations will consist of a nominal 300 by 300 ft. square box that will be subdivided into approximately 9 subareas. Samples will be collected from 5 of the subareas and provided to an independent 3rd party, approved by the MDEQ, that will randomly select one of the samples and submit it for laboratory analyses. The sample selected for analysis by the 3rd party will not be revealed to Dow, MDEQ, or the public until after area wide cleanup criteria are approved. The 3rd party will provide the results to Dow and MDEQ along with the sample station identifier only.
- The sample station "boxes" will be adjusted based on actual site conditions to 1) ensure an adequate number of properties are included within the station to protect the anonymity of the property analyzed and 2) capture properties of a similar land use where possible. Figure 2 provides a conceptual example of how the sample station "boxes" might be adjusted. The final locations and extent of each sample station will be developed jointly with and approved by MDEQ.
- Sample stations that are completely contained within a parcel or parcels owned by a single property owner will have a single sample collected from within the "box" unless the owner requests multiple samples. However, if multiple samples are taken only one sample will be selected for analysis consistent with other random sample selection procedures.
- Under specific conditions (as described below) the exact sample locations and results will be revealed to MDEQ and Dow prior to approval of area wide cleanup criteria. These conditions are limited to locations where the soil dioxin/furan TEQ exceeds 1,000 part per trillion (ppt) or soil concentrations of other target analytes are found

that present an unacceptable exposure. Residential properties with TEQs exceeding 1,000 ppt would be eligible for an Interim Response Activity (IRA).

- Property owners would be permitted to contact the aforementioned 3rd party to obtain information on whether samples from their property were tested and, if so, obtain the test results. Neither MDEQ nor Dow would be informed of the identities of parties requesting this information or the specific property results.

Support for Bioavailabilty Study

Samples will be collected primarily from areas that are representative of conditions on residential or public areas and will be analyzed for dioxins, furans, and the selected bioavailability parameters that will be listed in the revised work plan. Samples will not be analyzed for bioavailability parameters where sample stations are located on water bodies, or fully developed industrial or commercial properties (e.g., sample stations at the Dow Corning Plant, Midland Cogeneration Venture cooling water ponds, and City of Midland wastewater treatment plant, etc.) because surface "soils" in these areas are highly disturbed or are not present. Figure 1 indicates the locations where these samples will be collected based on a preliminary review of the sample stations. Final sample locations will be developed in consultation with MDEQ prior to submittal of the revised BSAP.

Provide Information on Hazardous Substances

Samples in proximity (the first two sample stations along each transect regardless of the current land use) to the Dow Midland Plant will be analyzed for the purpose of developing an expanded Target Analyte List (TAL) of substances that may potentially be related to Dow operations. Samples will be collected and analyzed from two intervals: zero to one-inch and one to six inches below grade. Figure 1 indicates the locations where these samples will be collected based on a preliminary review of the sample stations. Final sample locations will be developed in consultation with and subject to the approval of MDEQ prior to submittal of the revised BSAP.

Schedule

The revised BSAP will be submitted to MDEQ for approval by June 1, 2006. Subsequent to MDEQ review the BSAP may be submitted to the Independent Science Advisory Panel.

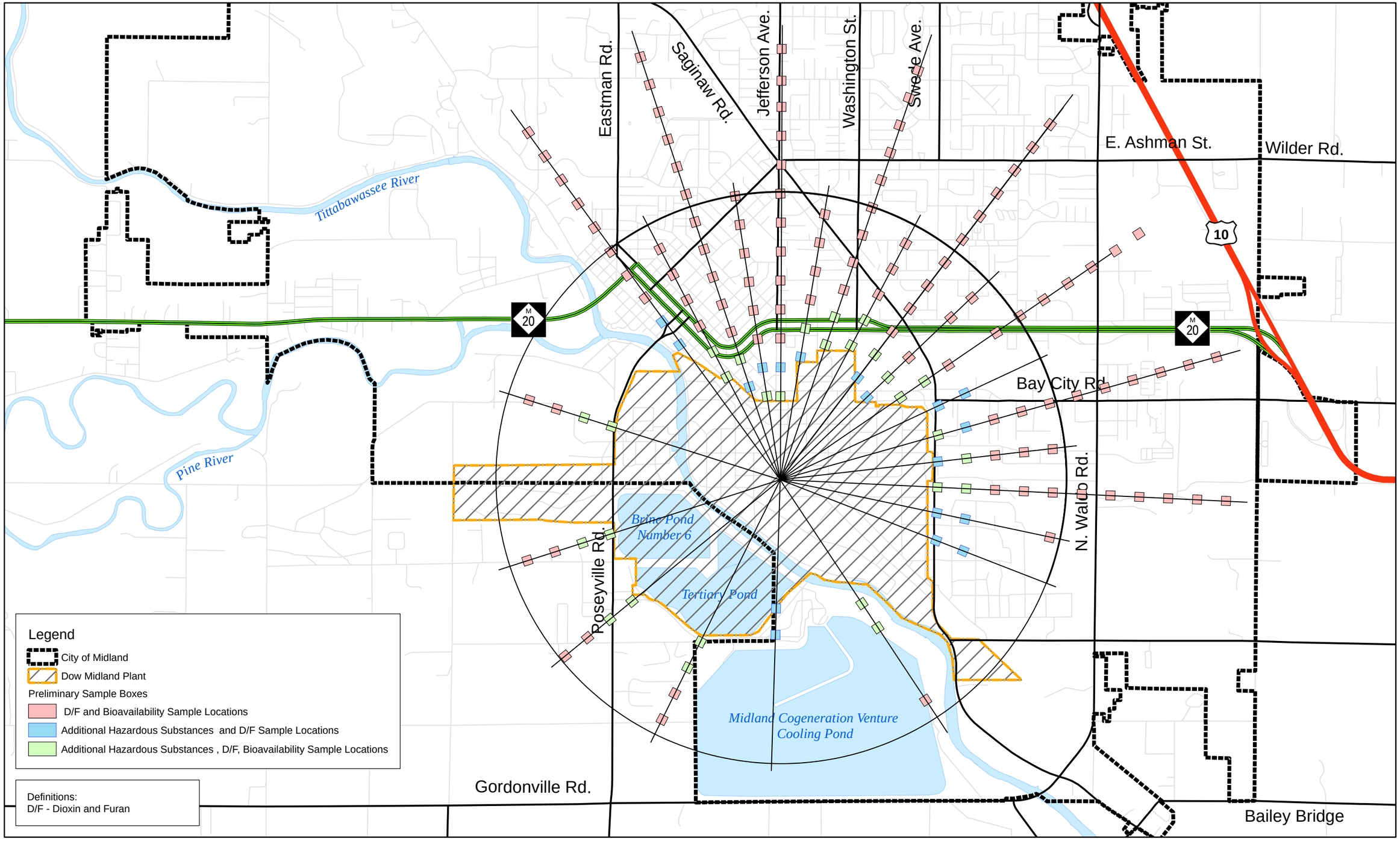

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Figure 1
Preliminary Sample Boxes
Sampling Approach in Support of Bioavailability Study

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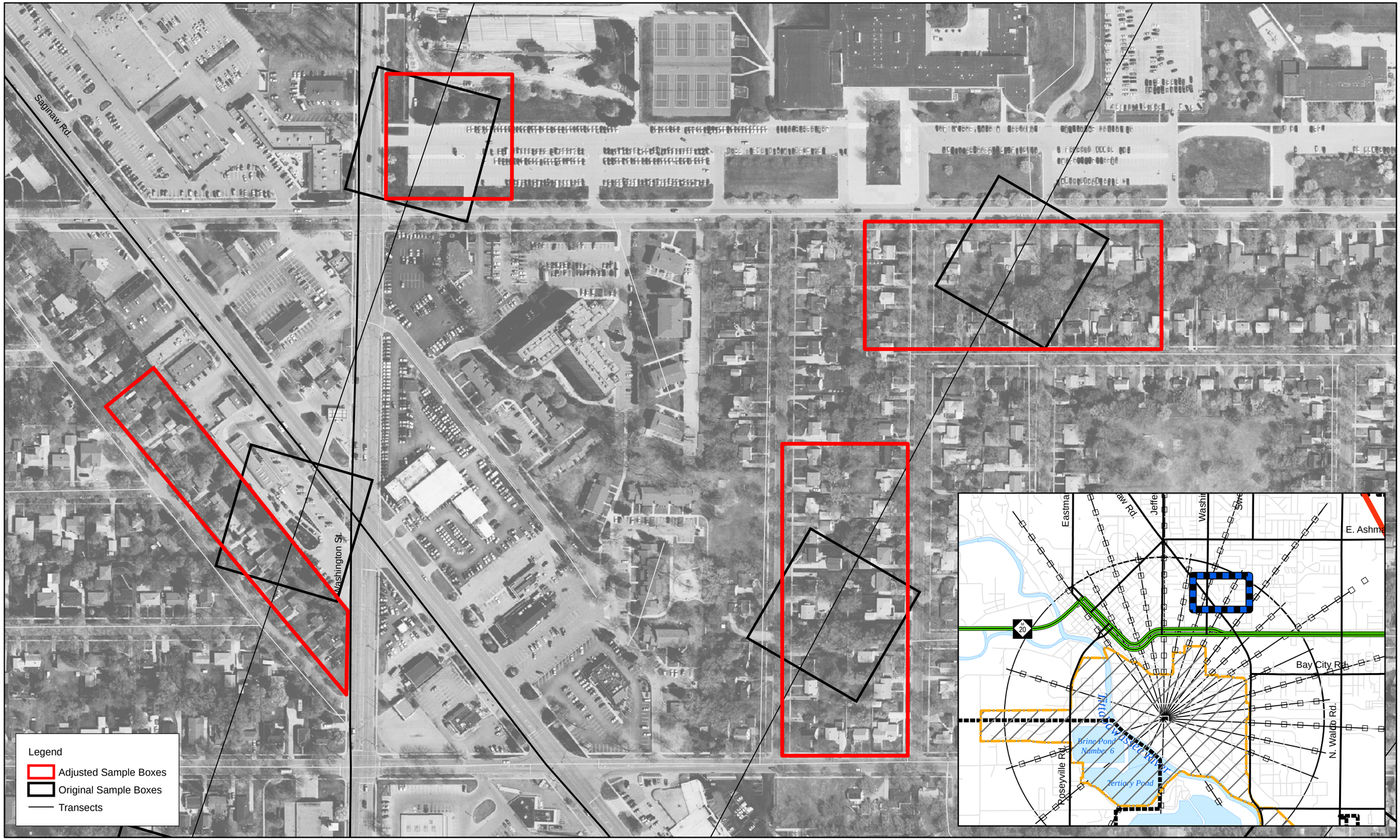

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Figure 2
Conceptual Example of Adjusted Sample Boxes
Sampling Approach in Support of Bioavailability Study

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